

# Does Farmer's Participation in Non-Farm Activities Reduce the Duration to Exit Poverty? A Case Study in Kedah, Malaysia

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*Poverty incidence in Malaysia has declined considerably from 52.4% in 1970 to 3.8% in 2009. In the 10<sup>th</sup> Malaysia Plan (2010-2015), it is targeted that by the year 2015 the mean income of the bottom 40% of households to be increased from RM1440 in 2009 to RM2300, and that poverty incidence will be reduced further to 2.0%. Notwithstanding the significant decline in aggregate poverty, it is worth mentioning that poverty in the rural areas is relatively higher than in the urban areas. In 2007, poverty incidence in the rural areas is 7.1%, while it is only 2.0% in the urban areas. Thus poverty in Malaysia remains as a rural phenomenon. This implies that to reduce poverty further and achieve the specified target in the 10<sup>th</sup> Malaysia plan, the bulk of the reduction should come from the reduction of poverty among the rural households. This raises the question on income growth and the duration of the rural poor to exit from poverty. This question is imperative since estimation on the duration of the rural poor to exit poverty is helpful to map the progress towards meeting the target. Since it appears that there is little empirical knowledge available on the duration of the poor in Malaysia to exit poverty, assessment on the duration of the poor, particularly among the rural households, would be useful. This paper is an attempt to shed some lights on this issue by estimating the Watts poverty index. The advantage of calculating the Watts poverty index is that it will enable analysis to be carried out to examine the impact of different income growth scenarios on the time taken to escape from poverty. Our particular interest is on the impact of farmer's participation in non-farm activities on the time to exit poverty among farmers. Furthermore, we also investigate whether the location where the farmers reside makes a difference on the duration to exit poverty. Towards this end, we carry out analysis based on primary data collected from farm households in the state of Kedah, Malaysia, which has relatively high poverty incidence. The results of our analysis suggest that, with income growing at 5%, the poor among our respondents will take an average about ten years to exit poverty. This finding implies that there is much to be done if the specified target is to be achieved. Besides, we also discover that farmers that participate in non-farm activities has shorter duration to exit poverty compared to those who did not participate. Thus, one of the options available is to induce the farmers to participate in non-farm activities.*

**Keywords:** Poverty, Watts poverty index, growth, time exit poverty, non-farm activities, Malaysia.

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## **1. Introduction**

Poverty incidence in Malaysia has declined considerably from 52.4% in 1970 to 3.8% in 2009. In the 10<sup>th</sup> Malaysia Plan (2010-2015), it is targeted that by the year 2015 the mean income of the bottom 40% of households to be increased from RM1440 in 2009 to RM2300, and that poverty incidence will be reduced further to 2.0%. Notwithstanding the significant decline in aggregate poverty, it is worth mentioning that poverty in the rural areas is relatively higher than in the urban areas. In 2007, poverty incidence in the rural areas is 7.1%, while it is only 2.0% in the urban areas. Thus poverty in Malaysia remains as a rural phenomenon. This implies that to reduce poverty further and achieve the specified target in the 10<sup>th</sup> Malaysia plan, the bulk of the reduction should come from the reduction of poverty among the rural households. This raises the question on income growth and the duration of the rural poor to exit from poverty. This question is imperative since estimation on the duration of the rural poor to exit poverty is helpful to map the progress towards meeting the target. Since it appears that there is little empirical knowledge available on the duration of the poor in Malaysia to exit poverty, assessment on the duration of the poor, particularly among the rural households, would be useful.

This paper is an attempt to shed some lights on this issue by estimating the Watts poverty index. The advantage of calculating the Watts poverty index is that it will enable analysis to be carried out to examine the impact of different income growth scenarios on the time taken to escape from poverty. Our particular interest is on the impact of farmer's participation in non-farm activities on the time to exit poverty among farmers. Furthermore, we also investigate whether the location where the farmers reside makes a difference on the duration to exit poverty. Towards this end, we carry out analysis based on primary data collected from farm households in the state of Kedah, Malaysia, which has relatively high poverty incidence. The results of our analysis suggest that, with income growing at 5%, the poor among our respondents will take an average about ten years to exit poverty. This finding implies that there is much to be done if the specified target is to be achieved. Besides, we also discover that farmers that participate in non-farm activities has shorter duration to exit poverty compared to those who did not participate. Thus, one of the options available is to induce the farmers to participate in non-farm activities.

## **2. Literature Review**

The rural economy of developing countries has long been regarded as synonymous with agriculture. But in recent years this view has begun to change. Such diverse activities as government, commerce, and services are now seen as providing most income in rural households. Studies have shown that non-farm income increasingly plays an important role and exhibits an increasing share in agricultural household income (De Janvry et.al, 2005; FAO, 1988). Thus, the non-farm (or off-farm) employment has been generally recognised to have the potential in raising agricultural household income, and therefore reducing rural poverty (FAO, 1998; Arif, Nazli and Haq, 2000; Lanjouw and Murgai, 2008; Foster and Rosenzweig, 2004). Non-farm

income gradually became an importance source of income for rural households, and served as an engine of growth for rural areas. In fact, Ranjan (2006) has pointed out several grounds on the desirability of developing the non-farm sector as a vehicle to reduce rural poverty. Among them are: (i) the growing rural communities cannot be sustained by the agricultural sector alone; (ii) rural economies are not purely agricultural and most of the rural communities derive their incomes from various sources rather than from agriculture per se; (iii) avoid rural-urban migration; (iv) reduce the rural-urban economic disparities; (v) reduce rural unemployment since rural industries are usually labour-intensive and hence, expected to absorb more labour; (vi) intensifies linkages between industry and agriculture, and thus support agricultural growth; (vii) reduce income inequality in the rural areas since the lower income group is expected to participate more intensely in non-farm activities; and (viii) encourage the participation of women in the non-farm sectors and hence empowering them. Adams (2001) on his study at Egypt and Jordan, find that non farm income has a greater impact on poverty and inequality. The poor receive almost 60 percent of their income from nonfarm sources in rural Egypt, while in rural Jordan they receive less than 20 percent.

Many study shows that non farm income will increase farmers income and reduce the number of poor people. Even my study before also investigate whether diversification of a farmer into non-farm activities reduces their probability of being poor or not<sup>1</sup>. Very little study on the effect of this non farm income on time taken to exit poverty. Is this income will shorter the duration to exit poverty? Gibson dan Olivia (2002), his study at Papua New Guinea, shows that with under historical growth rates, it would take an average of 20 years for the poor Papua New Guineans to escape from poverty. So in this study, with refer to Gibson dan Olivia (2002), we try to find out, is there any changes in term of duration taken to exit poverty among the poor and the extreme poor if the they involve in or not involve in non farm activities. We provide the empirical evidence on this question by using the practical usefulness of the average exit time measure of poverty developed by Morduch (1998) using primary data gathered among agricultural household in Kedah, Malaysia.

This paper is organised as follows. Section I provides the introduction, and Section II literature review, Section III discusses the sources of data, measures of poverty, and the model for estimation in the study. Section IV discusses the results, while Section IV concludes.

### **3. Data and Method**

#### ***The data and sampel***

The data used in this study is primary data which is gathered through a survey carried out on 384 agricultural households in the state of Kedah, Malaysia. The survey is conducted between the month of April and December 2008. A face to face interview

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<sup>1</sup> See: Does Farmer's Diversification Into Non-Farm Employment Reduce Their Likelihood Of Poverty? Evidence In Malaysia at: <http://www.wbiconpro.com/09-Siti-Malay.pdf>

were carried out with the the respondents, where they were chosen through a stratified random sampling. Six of the eleven districts in Kedah were chosen in this study. These are Kubang Pasu, Sik, Kota Star, Baling, Kulim dan Pulau Langkawi. Table 1 shows the number of respondents by district.

**Table 1: Respondents by district**

<b>District</b>	<b>Estimated agricultural households</b>	<b>Number of respondents</b>
Kubang pasu	8,736	71
Kota Star	16,541	135
Baling	5,913	48
Kulim	9,455	77
Pulau Langkawi	3,541	29
Sik	2880	23
<b>Total</b>	<b>47,067</b>	<b>384</b>

Source: Population and Family Development Board (2004)

For each district, the respondent is divided further according to the local economic characteristics (economic structure of the local economy), to investigate its effect on the probability of poverty. In this study, we divide the local economic characteristics into four, which is based on the intensity of agricultural and industrial activities in the area. These are as follows: (i) C1 means the farmer in this area have an advantage of high intensity of agricultural and industrial activities; (ii) C2 means the farmer in this area have an advantage on agricultural activities but has no or minimal industrial activities; (iii) C3, is the area which has minimal agricultural activities but also has no or minimal industrial activities; and (iv) C4, refer to the area which has minimal agricultural activities, but high intensity in industrial activities.

With regards to the non-farm activity, in this paper we refer non-farm activity as the participation of a farmer (or agricultural household) in remunerative work away from their plot of agricultural land (FAO, 1988). The non-farm job undertaken by the farmer could be permanent or casual in nature, covering both the secondary and tertiary sector of employment (Salter, 1991). Besides, to disaggregate the poor from the non-poor, poverty line income is used. The official gross poverty line income for the state of Kedah in 2009 is RM700<sup>2</sup>. Thus, in this study, a farmer with a household income that is equal or more than RM700 is considered non-poor, while those with household income that is less than RM700 is categorised as poor.

### ***The Watts poverty index and the duration of poverty exit***

In this study, we employ Watts poverty index to measure poverty as well as to estimate the average time to exit poverty (Watts, 1968). The Watts poverty index, W, can be written as follows:

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<sup>2</sup> e-SINAR.Kedah.gov.my

$$W = \frac{1}{n} \sum_i^m [\ln z - \ln y_i] \quad (1)$$

where,

$z$  = poverty line income

$y_i$  = income of individual  $i$  to  $m$

$n$  = total sample

where there are  $i$  individuals in the population indexed from 1 to  $n$  in ascending order of income and  $m$  is the number of people with income  $y$  below the poverty line  $z$ .

Despite the Watts poverty index has been proposed in the literature quite a long time ago, the index however has never been widely used since this index cannot be cardinally interpreted. Morduch (1998), transforms Watts poverty index to make it more useful and could be applied widely in poverty studies. Specifically, Morduch (1998) divides the Watts poverty index with  $\gamma$ , which is the growth rate of income. The outcome then could be interpreted as the average time needed by the poor to exit poverty, given that the growth rate of income is  $\gamma$ . Thus, following Morduch (1998), for a given income growth rate of  $\gamma$ , the average time for an individual  $i$  to exit poverty (i.e. for income of individual  $i$  to reach the poverty line income,  $z$ ) could be written as follows:

$$t_j \gamma = \frac{\ln z - \ln y_i}{\gamma} \quad (2)$$

What is more interesting is that, Morduch's transformation of Watts poverty index has enabled us not only to estimate the average time to exit poverty for individual  $i$ , but we also could estimate the average time to exit poverty for the total individual,  $N$  (including those who are not poor; i.e. those  $t_j \gamma = 0$ ). The Morduch's (1998), transformed Watts poverty index, the average time of poverty exit,  $t \gamma$ , could be written as follows:

$$t \gamma = \frac{1}{n} \sum_{i=1}^n t_j \gamma = \frac{1}{n} \sum_{i=1}^m \frac{\ln z - \ln y_i}{\gamma} = \frac{W}{\gamma} \quad (3)$$

Once the average time to exit poverty for overall sample is obtained, the average time to exit poverty among the poor,  $t^p \gamma$ , could be obtained by dividing  $t \gamma$  with the poverty headcount ratio, as follows:

$$t^p \gamma = \frac{t \gamma}{P_0} \quad (4)$$

where,  $P_0$  = headcount ratio =  $m/n$ , with  $m$  = total number of poor and  $n$  = total number of population or sample.

## 4. The Findings

Table 1 show the average time of poverty exit for the poor using hypothetical income growth of 3%, 5%, 6.5%, 8% and 10%. It should be worth mentioning here that the hypothetical income growth rate of 6.5% is actually the expected economic growth rate in the 10<sup>th</sup> Malaysia Plan. The average time of poverty exit is calculated for two groups of farmers – those farmers that derived their household income from farm sources only and also for farmers that participate in non-farm employment, and hence derived household income from both farm and non-farm sources.

Table 2 shows clearly indicate that as the hypothetical income growth is raised gradually from 3% to 10%, the average time for poverty exit for both groups gradually shorten. What is more interesting is that there is clear differences in the average time of poverty exit for farmers that derive income from farm activities only and those farmers that derives their household income not only from farm, but also non-farm sources. The results show that farmers that participate in non-farm activities, i.e. derives income from non-farm sources, the average time of poverty exit shorter than those who did not participate in non-farm activities. For instance, if household income of the farmers is growing at 6.5%, as expected in the 10<sup>th</sup> Malaysia Plan, the average time for the poor to exit poverty is 10.74 years for those poor farmers who derives income from farm sources only, while it is 8.57 years for those poor farmers who also derives income from non-farm sources. With income growing at 6.5%, those farmers that participates in non-farm activities is expected to shorten their average time of poverty exit of about 2 years than those who did not participate. In Table 3, we also calculate the average time of poverty exit for the extreme poor. The results appears similar to the earlier results in Table2. Among the extreme poor, the average time to exit poverty is shorter for those farmers that participate in non-farm activities compared to those who do not.

**Table 2: Average time of poverty exit (for poor).**

Hypothetical growth rate of income ( $\gamma$ )	Farm income Only <i>m=156, P<sub>0</sub>=40.94%</i>		Total Income (Farm + Non-Farm Income) <i>m=90, P<sub>0</sub>= 24.00%</i>	
	Average time of poverty exit for all respondents, i.e. $t^\gamma$	Average time of poverty exit for all the poor, i.e. $t^P \gamma$	Average time of poverty exit for all respondents, i.e. $t^\gamma$	Average time of poverty exit for all the poor, i.e. $t^P \gamma$
0.03	9.53	23.27	4.46	18.57
0.05	5.72	13.96	2.67	11.14
<b>0.065</b> ( <i>Projected growth rate in the 10<sup>th</sup> Malaysia Plan</i> )	4.40	10.74	2.06	8.57
0.08	3.58	8.72	1.67	6.97
0.10	2.86	6.97	1.34	5.57

Note: Poverty line income,  $z$ , = RM700

**Table 3: Average time of poverty exit (for extreme poor).**

Hypothetical growth rate of income ( $\gamma$ )	Farm income Only $m=89, P_o=23.00\%$		Total Income (Farm + Non-Farm Income) $m=43, P_o=0.11$	
	Average time of poverty exit for all respondents, i.e. $t^\gamma$	Average time of poverty exit for all the poor, i.e. $t^P \gamma$	Average time of poverty exit for all respondents, i.e. $t^\gamma$	Average time of poverty exit for all the poor, i.e. $t^P \gamma$
0.03	4.36	18.67	1.75	15.54
0.05	2.62	11.20	1.05	9.33
<b>0.065</b> ( <i>Projected growth rate in the 10<sup>th</sup> Malaysia Plan</i> )	2.01	8.61	0.81	7.17
0.08	1.64	7.00	0.66	5.83
0.10	1.31	5.65	0.53	4.66

Note: Poverty line income,  $z$ , = RM430

In this study, we also interested to find out whether the local economic characteristics where the farmers reside have an impact on the average time of poverty exit. As being mentioned in the earlier section, we divide the local economic characteristics into four, which is based on the intensity of agricultural and industrial activities in the area. These are as follows: (i) C1 = area which has significant agricultural and industrial activities; (ii) C2 = area which has significant agricultural activities but has no or minimal industrial activities; (iii) C3 = area which has minimal agricultural activities but also has no or minimal industrial activities; and (iv) C4 = area which has minimal agricultural activities, but is a major industrial area. Table 4 shows the average time of poverty exit by location (local economic characteristics). Our findings show that farmers that reside in an area where the local economy is characterised by agriculture and industrial activities (C1), their average time of poverty exit is shorter, i.e. 1.32 years. In contrast, the average time of poverty exit for farmers that reside in an area where the local economy is characterised by minimal agricultural and industrial activities (C3) is significantly longer, i.e. 5.26 years.

**Table 4: Average time of poverty exit (for poor) by location.**

Hypothetical growth rate of income ( $\gamma$ )	Farm income Only		Total Income (Farm + Non-Farm Income)	
	Average time of poverty exit for all respondents, i.e. $t^\gamma$	Average time of poverty exit for all the poor, i.e. $t^P \gamma$	Average time of poverty exit for all respondents, i.e. $t^\gamma$	Average time of poverty exit for all the poor, i.e. $t^P \gamma$
C1	$m=26; P_o=30\%$		$m=9; P_o=10\%$	
0.03	3.41	11.41	0.29	2.84
0.05	2.05	6.85	0.17	1.71
<b>0.065</b> (Projected growth rate in the 10 <sup>th</sup> Malaysia Plan)	1.57	5.26	0.14	1.32
0.08	1.28	4.28	0.11	1.07
0.10	1.02	3.42	0.09	0.85
C2	$m=65; P_o=49\%$		$m=22; P_o=17\%$	
0.03	13.39	27.39	2.88	17.31
0.05	8.03	16.46	1.73	10.38
<b>0.065</b> (Projected growth rate in the 10 <sup>th</sup> Malaysia Plan)	6.18	12.64	1.33	7.99
0.08	5.02	10.27	1.08	6.49
0.10	4.01	8.22	0.87	5.19
C3	$m=22; P_o=28\%$		$m=15; P_o=19\%$	
0.03	4.33	15.55	2.17	11.40
0.05	2.59	9.28	1.30	6.84
<b>0.065</b> (Projected growth rate in the 10 <sup>th</sup> Malaysia Plan)	1.99	7.14	1.00	5.26
0.08	1.62	5.80	0.81	4.28
0.10	1.29	4.64	0.65	3.40
C4	$m=24; P_o=29\%$		$m=4; P_o=5\%$	
0.03	4.77	16.45	0.48	9.92
0.05	2.86	9.87	0.29	5.95
<b>0.065</b> (Projected growth rate in the 10 <sup>th</sup> Malaysia Plan)	2.20	7.59	0.22	4.58
0.08	1.79	6.17	0.18	3.72
0.10	1.43	4.94	0.15	2.98

Note: Poverty line income,  $z$ , = RM700



## 5. Conclusion

Raising income of the poor farmers appears to be crucial in poverty eradication as well for them to escape from poverty. There are various ways to accomplish this objective. First, raising income of the farmers could be attained by agricultural diversification and/or intensification. Second, the farmer could also increase their income by participating in non-farm activities. The question then, which strategy is better for the farmers to exit poverty?

Our study reveals that while agricultural intensification and diversification may increase income of the farmers, it did not seem however be a good strategy for escaping poverty. We discover that farmers that participate in non-farm activities, i.e. those derives income from both farm and non-farm sources, has a clearly shorter average time to exit from poverty than those who did not participate in non-farm activities. Furthermore, we also find that the average time taken to exit poverty is also influence by the structure of the local economy where the farmers reside. Farmer that resides in an area where there is high intensity of agricultural and industrial activities has shorter time to exit poverty. Our findings imply that, the average time to exit from poverty could be shortened by inducing the poor farmers to participate in non-farm employment.

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